Ensuring Value in the Electronic Clinical Record

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HIMSS Health Story Project: Ensuring Value in the Electronic Clinical Record

Presented at New England HIMSS
1st Vermont & New Hampshire Annual Fall Event
October 11, 2013
Lebanon, New Hampshire
About me

• Background in electronic text, how to make large amounts of information usable on a computer
• As a volunteer have helped to
  – Bring XML to healthcare exchange standards
  – Develop the CDA, CCD, Consolidated CDA
  – Co-founded the Health Story Project
• Current day job as Lantana CEO
  – Support standards development and deployment
  – Manage staff for virtual company of about 40 FTEs
  – Approve all menus for company dinners
  – Bring groups to the Upper Valley on any excuse I can find
  – Participate in the CDA Academy (www.cdaacademy.com)
Ensuring Value in the Electronic Clinical Record

1. Challenge & Response
2. Background: 2006 to 2013
3. The “How”: Just enough about standards
4. Present & Future: Technology & Policy
Challenge

“I have never seen…a checkbox for apprehension…

“The medical record is not data. It contains data… but it is not data, nor is it simply a repository into which data are poured.

“… [it is ] information that has been transformed by the knowledge, skill, and experience of the physician…into an understanding of human experience…”
Structured data capture can be at odds with the expressivity, workflow, and usability factors preferred by clinicians. Authors recommend choice in data capture and text processing modalities.
Challenge

American College of Physicians, Board of Regents

• **Resolution Endorsing and Promoting a Method of Documentation to Improve Communications with the Electronic Medical Record**
  
  • Spring, 2013, A resolution endorsing and promoting
    
    – EMR documentation “that emphasizes the thought process underlying decision making, patient complexity, and medical necessity …
    
    – “with clarity and without requiring repetition of past notes, tests and extraneous data.”

American Medical Association Board Chair

• **HHS Should Address EHR Usability Issues Immediately**

  • May 15, 2013, AMA Wire
    
    – Report on testimony noting that physician dissatisfaction with EHR systems has increased,
    
    – Urging greater flexibility in meaningful use while systems are improved.
Challenge

Struck, Rhonda, DNP, RN

• **Telling the patient’s story with electronic health records**
• Nursing Management, July 2013
• Addresses
  – sense of loss of narrative in fragmented EHRs and
  – how to remediate via a comprehensive, cross-disciplinary patient portal.

Lawrence B. Marks, MD

• **Misperceptions on electronic health records**
• Newsobserver.com, October 4, 2013
  – “During any evaluation, I like to scan the prior notes to remind myself of how the patient has been doing over the last few weeks. ...with a paper chart, ...it was almost like reading a short story.
  – “Imagine reading a short story and being allowed to view only one paragraph at a time. Imagine needing to open or close multiple windows to move in between paragraphs or needing to search to determine whether there is a prior paragraph to read.”
A physician’s practical need for fast and easy (30 sec) methods of creating clinical documentation

The enterprise need for structured and coded information capture to support meaningful use
Challenge & Response

• Can we create an electronic record that ensures value for
  – Care delivery
  – Evidence-based medicine
  – And which endures over time, as technology evolves?

• Most electronic patient records and health information exchanges operate on a small percentage of the available information.

• Vision
  – Comprehensive electronic records that
  – Tell a patient’s complete health story.
Challenge & Response

• Use simple, stable, established formats for information exchange.
  – These exist, are inexpensive to implement, and
  – will lower the barriers to information sharing.

• Be more like the Web and less like a database.

• Open exchange networks to Big Data, incrementally structured.

• Benefits of this approach:
  – Less disruptive – adapts to wider range of technology, giving clinicians more choice in how they capture and communicate information.
  – More useful – the record is more complete, mitigating the distortion introduced by single-minded focus on structured data capture
Ensuring Value

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Background

- Non-profit, industry alliance
- Founded as “CDA for Common Document Types” (aka CDA4CDT) in 2006 by
  - M*Modal
  - Association for Healthcare Document Integrity (AHDI)
  - American Health Information Management Association (AHIMA)
  - Alschuler Associates (aka Lantana)
- Members provide direction, elect Executive Committee
- Supported development of eight (8!) implementation guides for common clinical documents within three years
- In 2013, affiliated with HIMSS as a HIMSS Roundtable
Project Members (pre-HIMSS)

Organization Affiliates

Promoters

Contributors

Canon U.S.A.

Participants

Apixio - BayScribe - ChartLogic
Emdat - Healthwise - InfraWare
Mediscrribes - MedEDocs - MEDfx
Physicians Medical Group of Santa Cruz County
St. John’s Regional Medical Center
Background

• Associate Charter Agreement with HL7
  – Health Story convened stakeholders and supported specification development
  – Balloted through HL7 which retains ownership

• Initiated project to **consolidate** 8 guides into single guide and also
  – Update Continuity of Care Document (CCD)
  – Harmonize with Integrating the Healthcare Enterprise (IHE)
  – Integrate constraints from ONC’s HITSP C32
  – Created Consolidated CDA (C-CDA) cited in MU2
Consolidated CDA

- CCD
- Consultation Note
- Diagnostic Imaging Report
- Discharge Summary
- H&P
- Operative Note
- Procedure Note
- Progress Note
- Unstructured Document

- Cited in Meaningful Use Stage 2
  - Except....
… but

• Meaningful Use Stage 2 does not leverage the simple, low-end of the standard.

• Instead,
  – it focuses exclusively on exchange of a narrow set of highly-structured data elements.
  – And it orphaned Unstructured Document

• How could this work if the policy were to change?
  – Stay tuned, but
  – first this word about … CDA
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The HL7 CDA

• HL7 Clinical Document Architecture
  – Release 1.0 2000; Release 2.0 2005
  – A specification for exchange of clinical documents, defining their structure and semantics
  – Abstract/generic specification covers all document/note/report types
  – ANSI standard developed by HL7’s Structured Documents Work Group (SDWG)
• Widely implemented, internationally, as an ISO standard
• CDA R2 relies on
  – XML
  – HL7 Reference Information Model
  – Controlled vocabularies (SNOMED, LOINC, CIE-9, HL7, etc.)
The CDA Document Defined

• CDA Release 2, section 2.1
• A clinical document ... has the following characteristics
  – Persistence
  – Stewardship
  – Potential for authentication
  – Context
  – Wholeness
  – Human readability
• Therefore, CDA documents are not
  – Data fragments, unless signed
  – Birth-to-death aggregate records
  – Electronic health records
CDA Basics

• A Header + Body
• CDA Header:
  – Patient, provider, and encounter information
  – Metadata required to manage the document in any context
• CDA Body
  – Clinical report
    • Discharge summary, Progress note, History and physical (H&P)...
    • Healthcare Associated Infection (HAI) Report
    • Cancer Registry report
    • Quality report
  – Contains the report information in both
    • narrative (free-text) form **required** and
    • coded (computable) form **optional**
Investing in Information

• CDA can be simple
• CDA can be complex
• Simple encoding relatively inexpensive
• Complex encoding costs more
• You get what you pay for
  – like charging a battery,
  – the more detailed the encoding
  – the greater the potential for reuse
Sample CDA

Header

Body

– Readable: required

– Computable: optional
Patient: Ellen Ross
17 Daws Rd.
Blue Bell, MA 02368
HP: (781) 555-1212

Birthday: January 27, 1960
Sex: Female
Consultant: Bernard Wiseman, Sr.
Created On: March 29, 200

Good Health Clinic Care Record Summary

Advance Directives

Documentations
- <reference value="Patient.rtf"/>
- <text mediaType="text/rtf">
  <reference value="Patient.rtf"/>
</text>

Conditions

Actors

CDA Body: Machine Processible

- Model-based computable semantics
  - Observation
  - Procedure
  - Organizer
  - Supply
  - Encounter
  - Substance Administration
  - Observation Media
  - Region Of Interest
  - Act

```xml
<title>Past Medical History</title>
  - <text>
    - <list>
      - <item>
        <content ID="a1">Asthma</content>
      </item>
      + <item>
      + <item>
    </list>
  </text>
  - <entry>
    - <observation classCode="COND" moodCode="entered" code code="39154008">
```
CDA: Incremental Semantic Interoperability

- Standard HL7 metadata
- Simple XML for point of care human readability
- RIM semantics for reusable computability ("semantic interoperability")
US Initiatives

- Meaningful Use...
- Healthcare Associated Infection (HAI) reporting to the National Healthcare Safety Network, Centers for Disease Control and Prevention
- Quality Reporting Document Architecture (QRDA)
- Patient Safety Common Format (AHRQ)
- Personal Health Monitoring (PHM), Continua Alliance
- CHNC Neonatal Care Report (Neonatal Care Report)
- New:
  - Clinical Oncology Patient Transfer Summary
  - Behavioral Health Assessment
  - HIV/AIDS Services Report
  - Privacy Consent Directives
  - Structured Form Definition Document
  - Transfer of Care, Referral Request and Report, Plan of Care
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Investing in Information

- CDA can be simple
- CDA can be complex
- Simple encoding relatively inexpensive, complex encoding costs more

- **Gall’s Law** is a **rule of thumb** from John Gall’s *Systemantics: How Systems Really Work and How They Fail*:
  - A complex system that works is invariably found to have evolved from a simple system that worked.
  - The inverse proposition also appears to be true: A complex system designed from scratch never works and cannot be made to work. You have to start over, beginning with a working simple system.
There is Structure in Dictated Notes

---

- `<component>`
  - `<section>`
    - `<templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.5"/>
    - `<code code="8648-8" displayName="HOSPITAL COURSE" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"/>
    - `<title>`Hospital Course`</title>`
    - `<text>`The patient was admitted and started on Lovenox and nitroglycerin paste. The patient had serial cardiac enzymes and was ruled out for myocardial infarction. The patient underwent a dual isotope stress test. There was no evidence of reversible ischemia on the Cardiolite scan. The patient has been ambulated. The patient had a Holter monitor placed but the report is not available at this time. The patient has remained hemodynamically stable. Will discharge.</text>`
  - `<entry>`
    - `<observation classCode="OBS" moodCode="EVN">`
      - `<code nullFlavor="NI"/>`
    - `I note that this patient has been on Prednisone for adrenal insufficiency in the past.`
Creating Discrete Entries

- Methods for acquiring codes from notes:
  - Computer-assisted coding (CAC)
  - Natural language processing (NLP)
  - Data capture templates
  - Good old text processing and pattern matching
  - Mobile and smart phone technology

- Applying standard HL7 CDA markup makes the discrete entries usable within an EHR and for the meaningful use program
- Defining the target structure and entries makes NLP engines smarter
Evolutionary Semantic Interoperability with CDA R2

1. GIF, JPG, TIFF
2. PDF, DOC(X), TXT
3. CDA R2 Nonstructured Body
4. CDA R2 Structured Body: Standardized sections
5. CDA R2 Structured Body: Standardized sections, Coded entries
6. CDA R2 IG

Additional effort to achieve it

Interoperability increase level

Add content

Add structure

Add structured clinical content

For “My region/use case”
We are looking for a shift in policy

- Lower the threshold for information exchange so that
  - all may participate
  - approach 100% of the records for 100% of patients
- Incentivize participation
  - at all levels with
  - higher reward where there is higher potential to automate reuse.
- Recognize diversity of applications
  - EMR is not the proverbial hammer
  - need applications to originate, manage, code, and analyze
- Respect
  - the clinical thought process inherent in documentation
  - the need for data that is concise and relevant as well as coded
- Provide value back to those who incur the costs
We are looking for a shift in policy

- Approximately 1.2 billion narrative clinical documents are produced in the US each year.
- These documents comprise around 60% of clinical information captured in electronic health records.
- Thought processes are captured via physician narrative, never via checkboxes.
- This tremendous source of valuable clinical information is completely underutilized.
- Technologies are now available to make the unstructured clinical record accessible and actionable.
A physician’s practical need for fast and easy (30 sec) methods of creating clinical documentation

The enterprise need for structured and coded information capture to support meaningful use
Incremental Approach

1. Get the data flowing, get the data flowing, get the data flowing.
2. Incrementally add structure, where cost effective to do so.

SNOMED CT
- Disease, DF-00000
- Metabolic Disease, D6-00000
- Disorder of carbohydrate metabolism, D6-50000
- Disorder of glucose metabolism, D6-60100
- Diabetes Mellitus, DB-61000
- Neonatal, DB-75110
- Type 1, DB-61010
- Carpenter Syndrome, DB-02324
- Insulin dependent type IA, DB-61020
Value Statement

• A health record is the patient’s “health story”
  – shared by the patient and the circle of caregivers
  – sharing encompasses both access and authorship.
• The primary purpose of the record is to support care delivery
  – This, in turn, will support better health.
  – Secondary reuse should be supported.
• Electronic records must produce a longitudinal record of lasting value
  – expressing the thought processes behind the delivery of care,
  – preserving this for future readers.
• Clinical records must be complete, well organized, easy to navigate,
concise, logical, adaptable to the needs of the user, sharable, and secure.
• Electronic records and new technologies
  – support shared decision-making,
  – document use of practice guidelines, and
  – support evidence-based practice.
<table>
<thead>
<tr>
<th>Benefit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retains patient story</td>
<td>Maintains primary role of documentation to clearly describe and communicate what is going on with patient.</td>
</tr>
<tr>
<td>Preserves physician time for clinical care</td>
<td>Makes efficient use of physician time by enabling choice of documentation methods and fosters EMR acceptance</td>
</tr>
<tr>
<td>Supports meaningful use</td>
<td>Interoperability: implements HL7 CDA document standards for electronic exchange of clinical information – incrementally</td>
</tr>
<tr>
<td>Enables data reuse</td>
<td>Structured narrative enables better outcomes reporting, data mining, and decision support</td>
</tr>
<tr>
<td>Collaborative approach</td>
<td>Developed by broad array of providers, vendors and IT organizations; Balloted process through HL7 supports harmonization</td>
</tr>
</tbody>
</table>
“It’s been challenging for docs and healthcare systems in general … to produce a document that reflects the patient story in the most concise, complete and informational way.”

Jody Cervenak, Aspen Advisors
Challenge

The Challenge to the Medical Record

Observe, record, tabulate, communicate.
Sir William Osler

Thirty years ago, not long after I began teaching first- and second-year medical students how to take patient medical histories and perform physical examinations, it occurred to me that I was trying to teach them how to write. Instead of forming words like elektronik, studies, and use, they had become more and more inescrutable, it has spawned a small army of people who “need” to know what happened in the examination room or at the bedside. They need to know because their livelihoods and the functioning of the system as a whole depend on it. This group includes administrators, policy makers, coders, support staff, information technologists, business,

“Data that have been copied and pasted into the medical record or inserted in a rapid series of mouse clicks has bypassed this critical transformative process…”

“I fear that as it becomes more and more difficult to write like a clinician, sooner or later it will become more difficult to think like one.”

JAMA, Internal Medicine, published online, May 27, 2013
Learn More, Stay in Touch, & Get Involved

• Get on mailing list
• Attend weekly calls
• Get involved
  – Filling gaps in technical specs
    • Patient-originated notes
    • Diet & Nutrition
    • What else?
  – Recruitment campaign
  – HIMSS 2013 Showcase
Demonstrating Consolidated CDA on the floor at HIMSS12, HIMSS11 & at HIMSS13
Contact!

- [http://www.himss.org/health-story-project](http://www.himss.org/health-story-project)
- Mission statement
- Value statement
- Bibliography
- Press release on HIMSS Health Story
- HIMSS Staff Support
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